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ANALYSIS OF PHOTO INTERPRETATION
RAPID COPY VIEWER/PRINTER
PROJECT 9618
SEPTEMBER 12, 1967

Declass Review by NGA.

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Manufacturing Estimate

The manufacturing estimates presented in the original price proposal package were considerably less than the actual pricing and quotations received recently. As an example the price estimate (loaded) of the condenser assembly was [redacted] while the actual price (or quotation) was [redacted] a variance of [redacted] (not including the overhead and G&A rate changes). Other price changes have varied as much as 10%-15%. It must be noted that the costs involved in the manufacture and design of a complex variable condenser system must incorporate synchronization of varying condenser elements. The [redacted] depicts the costs involved in the complete condenser illumination package. To ascertain the exact areas where this average might have occurred is a difficult task because it is comprised of a mixture of material charges, design, drafting, optical design, electrical design and engineering hours.

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Overhead and G&A Rates

From the time the program was quoted until the present time the internal [redacted] overhead and G&A rates have changed as follows:

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	Proposal Time	Present Time
Overhead:	130%	154%
G&A	12%	17%

This change has contributed ~~heavily~~ to the financial difficutly of the program.

Optical Engineering

Despite the fact that no optical engineering time was allotted or anticipated on the original pricing considerable money was expended to improve the quality of the equipments performance. To make the overall configuration more realistic and better human engineered we went from one folded mirror to three folded mirrors. The total price of these mirrors is [redacted] versus the anticipated spending of a few hundred dollars. In order to keep the processor closer to the viewer and reduce the overall size of the package the rotating mirror design was replaced with a flipping mirror, besides the number of optical engineering hours put into the projection optical path to optimize resolution and light gathering power. The condenser lens required

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optical lens design. This work was done in conjunction with the [redacted] computer. STAT
Two-hundred engineering hours were devoted to the solution of the condenser lens.

Automatic Exposure Control

The change from a manual exposure control to an automatic exposure was required in an addendum sheet. This may seem inconsequential. The best estimate at the time indicated that there would be no additional increase in cost. However considerable engineering hours were used during the investigation of a commercially available unit. The cost to purchase, assemble, and wire this system into the viewer was not part of the original proposed pricing package. Interface problems had to be settled between the processor package and the printer itself to insure proper light levels for viewing and yet deliver a high acuity processed print.

Film Chip Mechanism

This area became a very substantial part of the film transport mechanism. The exact requirements on the film chip mechanism were clarified through verbal discussions with the C.O.R. after the contract had been initiated. Considerations had to be given to the area of loading and unloading of the film chip while attaining proper registration and image quality.
Redesign was required to incorporate this application after the verbal discussion took place. It had originally been anticipated that a standard film chip mechanism might be used similar to several existing on previous designs. This was unfortunately not the case.

10" by 10" Prints

The original proposal required only 20" by 20" prints. The 10" by 10" prints capability not only required the change from fixed loading to adjustable loading control, but also required that the 10" by 10" print be centered on the optical axis. This area which appears in the addendum sheet required considerably more design engineering effort and fabrication than had been estimated. Approximately 175 design and drafting hours were required to incorporate this capability into the overall package and yet stay within the required dimensional specifications required for good human engineering design.

Miscellaneous

The progress reports beginning March 31 thru July 31 indicate a series of unresolved technical problems and the disposition thereof. It should be noted that any one of these taken by itself and at the time of consideration may seem quite inconsequential as related to cost. The unfortunate situation remains that the aggregate value in both time and money becomes considerable and, if estimated, reveals itself to become approximately 8% of the contracted value.

Some of these have been mentioned previously and we now refer to several additional items.

March 31, 1967	Section 3.0 Item a.	The exposure control scheme.
April 30, 1967	Section 5.0 Item 5.2	Relocation of focus control knob.
	" 5.4	Utilization of 3 folding mirrors instead of one.
	" 5.5	Rotating mirror replacing flipping mirror.
	" 5.7	Corner markings required for 10 by 10 print.
	" 5.9	Motorized fine focus instead of manual.
	" 5.10	Increase in number of controls
	" 5.16	Change from 10" - 20" pilot light to be automatic.
	" 5.17	Exposure platen to have vertical edge guide of transparent plastic.
	" 6.2	Use of adjustable mask.

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